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10/530,085

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Takao Tsuruoka

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EXAMINER

HERNANDEZ, NELSON D

ART UNIT

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2622

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/530,085	Applicant(s) TSURUOKA, TAKAO	
	Examiner Nelson D. Hernández Hernández	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) 8-16 and 19-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 2, 3, 5 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the labels of the Drawings as filed are not in English language. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Election/Restrictions

3. Applicant's election without traverse of Species 1 in the reply filed on June 16, 2008 is acknowledged.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 17 and 18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

Regarding claim 17, claim 17 recites “An image pickup program stored in a machine readable medium for execution by a computer, comprising the steps of:” “An image pickup program” as claimed does not define structural and functional interrelationships between the data structure, the computer software and hardware components, which permit the data structure to be realized. What is the interrelationship between the machine readable medium, the image pickup program, the computer and the camera system? Since a computer program is merely a set of instructions capable of being executed by a computer, the program logic itself is not a process; therefore the invention as claimed is non-statutory. The Examiner also noted that the claim appears to associate the program with the machine readable medium, however the claim as written is not directed to the machine readable medium being encoded with a program. It appears to be directed to the program and not said machine readable medium.

Claim 18 is also rejected under 35 U.S.C. 101 as it depends from claim 17.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 17 and 18** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 17, claim 17 recites "An image pickup program stored in a machine readable medium for execution by a computer, comprising the steps of :". The examiner noted that the Specifications as originally filed does not have disclosure for "An image pickup program stored in a machine readable medium for execution by a computer". The Examiner acknowledges that the Specifications as originally filed (i.e. page 25, line 16 – page 29, line 21) attempts to describe the invention as being performed by a software, however, no disclosure is made as to whether the software is stored on a machine readable medium for execution by a computer.

8. **Claim 18** is also rejected under 35 U.S.C. 112 as it depends from claim 17.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Til et al., WO 97/23993 A.

Regarding claim 1, Til et al. discloses an image pickup system (See fig. 2) comprising: a block extracting unit (performed by block generator 2 as shown in fig. 1) for extracting a block area with a predetermined size from a signal of an image pickup device (Page 11, lines 1-6); a transforming unit (Fig. 1: 3) for transforming the signal in the block area extracted by the block extracting means unit into a signal in a frequency space (Page 11, lines 13-24); a noise estimator (Fig. 1: 4) for estimating an amount of noise of a frequency component except for a zero-order component based on a zero-order component in the signal in the frequency space transformed by the transforming unit (Page 11, line 24 – page 12, line 25); a noise reducing unit (Fig. 1: 5) for reducing noise of the frequency component except for the zero-order component based on the amount of noise estimated by the noise estimator (Page 11, lines 16-20; page 13, lines 3-26); and a compressing unit (Fig. 1: 6) for compressing the zero-order component and the frequency component except for the zero-order component from which the noise is reduced (Page 13, lines 3-26) (See also page 13, line 27 – page 14, line 30 for image pickup system details).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Til et al., WO 97/23993 A in view of Yonekawa et al., US Patent 5,046,121.

Regarding claim 4, Although Til et al. discloses correcting the frequency component except for the zero component based on an upper limit value and an lower limit value set by the noise estimator (page 12, lines 3-25) based on the DC component which is used to set the statistical variances to determine said upper and lower limits, Til et al. does not explicitly disclose an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit.

However, Yonekawa discloses an image data compression apparatus (See fig. 1), comprising a DCT device (Fig. 1: 20) for transforming the image signal into frequency space, wherein an average of the amplitude of the AC components is

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calculated to determine an upper and lower limit value of the frequency component except for the zero order component (DC component), wherein said upper limit and lower limit are used as reference for correcting the frequency components based on the range so that the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, can be suppressed to compress the image data while retaining a higher image quality (Col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45).

Therefore, taking the combined teaching of Til et al. in view of Yonekawa as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to apply the concept of averaging the AC components to create an upper and lower limit to adjust the AC components based on said upper and lower limits as taught in Yonekawa to modify the teaching of Til et al. to have an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit. The motivation to do so would have been to allow proper correction of the dynamic range of the image and to have the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, be suppressed to compress the image data while retaining a higher image quality.

Regarding claim 6, the combined teaching of Til et al. in view of Yonekawa as discussed and analyzed in claim 4 further teaches that the noise reducing means unit further comprises: a threshold setting unit for setting an amplitude value of the noise of the frequency component except for the zero-order component as a threshold value based on the amount of noise estimated by the noise estimating unit (see Yonekawa as discussed with respect to claim 4, col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45); and a smoothing unit for reducing an amplitude component which is below the threshold set by the threshold setting unit with respect to the frequency component except for the zero-order component (Yonekawa teaches adjusting the amplitude values of the AC component as a result of a comparison between the AC component and the threshold (R); col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45).

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Til et al., WO 97/23993 A in view of Takayama, US Patent 6,512,791 B1.

Regarding claim 17, Til et al. discloses an image pickup method, comprising the steps of: a) extracting a block area of a predetermined size from a signal provided by an image pickup device (performed by block generator 2 as shown in fig. 1; page 11, lines 1-6); b) transforming the signal in the block area extracted in step (a) into a signal in a frequency space (performed by transformer unit 3 as shown in fig. 1; page 11, lines 13-24); c) estimating an amount of noise in a frequency component except for a zero-order component based on the zero-order component in the signal in the frequency space transformed at step (b) (performed by noise estimator 4 as shown in fig. 1; page 11, line 24 – page 12, line 25); d) reducing noise in the frequency component except for

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the zero-order component based on the amount of noise estimated at step (c) (performed by noise attenuator 5 as shown in fig. 1; page 11, lines 16-20; page 13, lines 3-26); and e) compressing the zero-order component and the frequency component except for the zero-order component from which the noise is reduced (performed by synthesizing unit 6 as shown in fig. 1; page 13, lines 3-26) (See also page 13, line 27 – page 14, line 30 for image pickup system details).

Til et al. does not explicitly disclose that the image pickup method is performed by an image pickup program executed stored in a machine readable medium for execution by a computer.

However, Takayama discloses a method of encoding an image captured by an image pickup device (See figs. 1 and 7) wherein said image is subjected to a frequency transform by applying a discrete cosine transform and using the DC component of said transform to estimate a noise value in order to correct the noise from the image (Col. 4, line 49 – col. 7, line 64). Takayama further discloses that said method can be preformed as a program (Col. 14, lines 40-46).

Therefore, taking the combined teaching of Til et al. in view of Takayama as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to perform the noise reduction method in Til et al. in a program stored in a machine readable medium to be executed by a computer. The motivation to do so would have been to reduce the amount of processing performed in an image pickup device and to allow modification of the process steps as required for a particular application.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Til et al., WO 97/23993 A in view of Takayama, US Patent 6,512,791 B1 and further in view of Yonekawa et al., US Patent 5,046,121.

Regarding claim 18, although Til et al. discloses correcting the frequency component except for the zero component based on an upper limit value and an lower limit value set by the noise estimator (page 12, lines 3-25) based on the DC component which is used to set the statistical variances to determine said upper and lower limits, the combined teaching of Til et al. in view of Takayama fails to teach that the step (d) further comprises: (f) calculating an average of the frequency component except for the zero-order component; (g) setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated at step (f) and the amount of noise estimated by at step (c); and h) correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set at step (g).

However, Yonekawa discloses an image data compression apparatus (See fig. 1), comprising a DCT device (Fig. 1: 20) for transforming the image signal into frequency space, wherein an average of the amplitude of the AC components is calculated to determine an upper and lower limit value of the frequency component except for the zero order component (DC component), wherein said upper limit and lower limit are used as reference for correcting the frequency components based on the range so that the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, can be suppressed to compress the image data while retaining a higher image quality (Col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45).

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Therefore, taking the combined teaching of Til et al. in view of Takayama and further in view of Yonekawa as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to apply the concept of averaging the AC components to create an upper and lower limit to adjust the AC components based on said upper and lower limits as taught in Yonekawa to modify the teaching of Til et al. and Takayama to have an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit. The motivation to do so would have been to allow proper correction of the dynamic range of the image and to have the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, be suppressed to compress the image data while retaining a higher image quality.

Allowable Subject Matter

15. **Claims 2, 3, 5 and 7** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

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Regarding claim 2, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, an obtaining unit for obtaining a temperature T of an image pickup device and a gain G of the signal; a giving unit for providing standard values of the temperature T of the image pickup device and the gain G of the signal; a coefficient calculator for calculating coefficients A , B , and C based on three functions $a(T, G)$, $b(T, G)$, and $c(T, G)$ using parameters serving as the temperature T provided by one of the obtaining unit and the giving unit and the gain G provided by one of the obtaining unit and the giving unit; and a noise calculator for calculating an amount N of noise by using a value L of the zero-order component and the coefficients A , B , and C based on one of functional expression expressions $[N = ALB + C]$ and $[N = AL^2 + BL + C]$, including all the limitations of claim 1.

Regarding claim 3, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, an obtaining unit for obtaining a temperature T of an image pickup device and a gain G of the signal; a giving unit for providing standard values of the temperature T of the image pickup device and the gain G of the signal; and a look-up table unit for obtaining an amount N of noise by inputting a value L of the zero-order component, the temperature T provided by one of the obtaining unit and the giving unit, and the gain G given by one of the obtaining unit and the giving means unit, including all the limitations of claim 1.

Regarding claim 5, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, a frequency separating unit for separating the frequency component except for the zero-order component of predetermined frequency bands; and a selecting unit for selecting whether or not noise

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is reduced from the frequency band separated by the frequency separating unit,
including all the limitations of claims 1 and 4.

Regarding claim 7, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, a frequency separating unit for separating the frequency component except for the zero-order component of predetermined frequency bands; and a selecting unit for selecting whether or not noise is reduced from the frequency band separated by the frequency separating unit,
including all the limitations of claims 1 and 6.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernández Hernández whose telephone number is (571)272-7311. The examiner can normally be reached on 9:00 A.M. to 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nelson D. Hernández Hernández
Examiner
Art Unit 2622

NDHH
August 27, 2008

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622